CLAIMS:

1. A forced air cooling system for an APU housed within a compartment, the forced air cooling system comprising:

   at least one inlet opening for providing air to an oil cooler;

   an exhaust opening in the compartment;

   the oil cooler being located in the compartment;

   a plenum in fluid communication with the exhaust opening and with the oil cooler; and

   a compressor rotated by a rotating shaft of the APU such that the compressor and rotating shaft rotate at a same speed, the rotating compressor induces a cooling air flow through the oil cooler.

2. The forced air cooling system according to claim 1, wherein the exhaust opening also evacuates an exhaust flow of the gas turbine engine.

3. The forced air cooling system according to claim 2, wherein a cooling passage provides the fluid communication between the plenum and the exhaust opening, and an exhaust passage merges with the cooling passage upstream of the exhaust opening and downstream of the compressor, the exhaust passage receiving the exhaust flow of the gas turbine engine.

4. The forced air cooling system according to claim 3, wherein the exhaust and cooling passages are annular and concentric, the cooling passage being located

radially inward of the exhaust passage, and the plenum is connected to the cooling passage through hollow struts extending across the exhaust passage.

5. The forced air cooling system according to claim 1, wherein the compressor is a centrifugal compressor.

6. The forced air cooling system according to claim 1, wherein the compressor is an axial compressor.

7. The forced air cooling system according to claim 1, wherein the plenum is annular and located around a casing of the gas turbine engine.

8. The forced air cooling system according to claim 1, wherein the compartment is at least partially defined by an outer skin of the aircraft, and the inlet opening is provided in the outer skin.

9. The forced air cooling system according to claim 1, wherein the inlet opening is provided in an inlet duct delivering air to a at least one of a load compressor and a core compressor of the gas turbine engine.

10. The forced air cooling system according to claim 1, wherein the compressor is supported on a second shaft which is coaxial with the rotating shaft of the gas turbine engine.

11. The forced air cooling system according to claim 1, wherein the compressor is substantially aligned with the plenum along an axial direction of the rotating shaft.

12. The forced air cooling system according to claim 1, wherein the gas turbine engine is an auxiliary power unit in an aircraft.

13. A gas turbine engine comprising:

at lease one rotating shaft;

at least a first compressor rotated by the rotating shaft;

a combustor in fluid communication with the first compressor, the combustor producing an exhaust flow;

at least one turbine in fluid communication with the combustor, the turbine extracting energy from the exhaust flow and driving the rotating shaft;

an oil cooler receiving lubrication oil from at least the turbine section in a closed circuit;

an exhaust opening in fluid communication with the turbine section for evacuating the exhaust flow;

a cooling air passage providing serial communication between the oil cooler and the exhaust opening; and

an auxiliary compressor directly driven by the rotating shaft, the auxiliary compressor being located downstream of the turbine and within the cooling air passage, the auxiliary compressor reducing an air pressure between the auxiliary compressor and the oil cooler, thereby inducing a cooling air flow through the oil cooler and out of the exhaust opening.

14. The gas turbine engine according to claim 13, wherein the auxiliary compressor is a centrifugal compressor.

15. The gas turbine engine according to claim 13, wherein the auxiliary compressor is an axial compressor.

16. The gas turbine engine according to claim 13, wherein the cooling air flow coming out of the exhaust opening is sufficiently pressurized to reduce a back pressure of the gas turbine engine.

17. The gas turbine engine according to claim 13, wherein an exhaust passage provides the fluid communication between the turbine and the exhaust opening, the cooling air passage being located radially inward of the exhaust passage, and the exhaust passage and the cooling air passage merge upstream of the exhaust opening and downstream of the auxiliary compressor.

18. The gas turbine engine according to claim 13, wherein the auxiliary compressor is driven by the rotating shaft through a second shaft which is coaxial with the rotating shaft.

19. The gas turbine engine according to claim 13, wherein the gas turbine engine is an auxiliary power unit in an aircraft.

20. A method for cooling a gas turbine engine, the method comprising the steps of:

rotating a turbine section of the gas turbine engine such as to drive a rotating shaft;

flowing oil lubricating parts of at least the turbine section of the gas turbine engine through an oil cooler;

driving an auxiliary compressor with the rotating shaft, the auxiliary compressor being located downstream of the turbine section;

generating a pressure differential between opposed sides of the oil cooler with the compressor;

inducing a cooling air flow through the oil cooler with the pressure differential; and

cooling the oil within the oil cooler with the cooling air flow, thereby cooling the gas turbine engine.

21. The method according to claim 20, further comprising the step of cooling external components of the gas turbine engine with the cooling air flow before the cooling air flow goes through the oil cooler.

22. The method according to claim 20, further comprising the step of discharging the cooling air flow through an exhaust opening of the gas turbine engine, the exhaust opening also discharging an exhaust flow of the turbine section of the gas turbine engine.